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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,673	09/17/2003	Hiroya Kirimura	TGW-0202	2468

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WASHINGTON, DC 20036

EXAMINER
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ARANCIBIA, MAUREEN GRAMAGLIA

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/663,673

Applicant(s)

KIRIMURA ET AL

Examiner

Maureen G. Arancibia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15 is/are pending in the application.
- 4a) Of the above claim(s) 5-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2 December 2005 has been entered.

### *Information Disclosure Statement*

2. The information disclosure statement filed 01/14/2005 fails to fully comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent, publication, or other information listed that is not in the English language, specifically, **the Japanese Patent Office Action mailed on 01/04/2005**. It has been placed in the application file, but the information referred to in the Non Patent Literature section has not been considered.

3. Contrary to Applicant's assertion, the Examiner did previously consider the foreign patent documents that were filed with an IDS on 14 January 2005, as indicated on the initialed copy of the IDS mailed to Applicant on 1 April 2005. The Japanese Patent Office Action of 4 January 2005, in Japanese, was not considered, because the IDS did not include a concise explanation of this document.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. **Claims 1-4 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.**

Specifically, the amendment to independent Claim 1 to recite that the plurality of gas holes includes a first set of gas supply holes *arranged in a matrix of columns and rows* and a second set of gas supply holes *arranged in a pattern superimposed on the matrix*, the first and second set of gas supply holes being in fluidic independence of each other, as well as the recitation in newly added Claim 15 that *the second set of gas supply holes are arranged in a criss-crossed pattern superimposed on the matrix*, appears to add new matter to the claims that is not supported by the original disclosure. Appropriate clarification and/or correction are requested. Moreover, Applicant is requested to expressly identify the portions of the original disclosure that provide support for any future amendments. Claims 2-4 are rejected due to their dependence on Claim 1.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**7. Claims 1 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Application Publication 06-275543 to Okamoto et al. in view of U.S. Patent 6,468,387 to Ahn and U.S. Patent 5,595,606 to Fujikawa et al. The following rejection refers to the Figures and English Machine Translation of Okamoto et al.**

In regards to Claim 1, Okamoto et al. teaches an apparatus (Figure 1) for forming a thin film (Paragraph 16), comprising a vacuum container 1 with an exhausting device 11 (Paragraph 11); a gas supplying device opposed to the surface of article 3, with a gas supply surface portion 4 and gas supply holes 41; a power applying device including a power applying electrode 5 disposed in a surrounding region around a space between the article to be coated and the gas supply surface 4 (Figure 1; Paragraph 13); and power supply 51 connected to electrode 5, which produces a uniform plasma from the gas (Figure 1; Paragraphs 19 and 20). The article 3 is disposed on a grounded supporting member 2. (Figure 1)

Okamoto et al. does not expressly teach that the gas supply member can be disposed in the vacuum container without connection to the power source for forming the plasma.

Ahn teaches that a gas supply member 38 can be disposed in a vacuum container 12 without connection to a power source for forming the plasma. (Figure 7; Column 7, Lines 8-16) The power source 32 for forming the plasma is connected to power applying electrodes 24, 25, 26, 27. (Figure 6)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by Okamoto et al. to have the gas supply member not be connected to the power source for forming the plasma, as taught by Ahn. The motivation for making such a modification, as taught by Ahn (Column 5, Line 40 - Column 7, Line 44), would have been to introduce the reactive gas from above the plasma generated by the power applying electrodes, so that the gas passes through the uniform, dense plasma on its way to the article to be processed.

In regards to Claims 1 and 15, the combination of Okamoto et al. and Ahn does not expressly teach that the gas supply portion of the gas supply member has a first set of gas supply holes arranged in a matrix of columns and rows and a second set of gas supply holes arranged in a criss-cross pattern superimposed on the matrix, with the first and second sets of gas supply holes being in fluidic independence of each other.

Fujikawa et al. teaches that a gas supply portion of a gas supply member (Figure 10) has a first set of gas supply holes 52b arranged in a matrix of columns and rows and a second set of gas supply holes 54b arranged in a criss-cross pattern superimposed on the matrix, with the first and second sets of gas supply holes being in fluidic independence of each other. (Figure 11)

It would have been obvious to one of ordinary skill in the art to modify the combination of Okamoto et al. and Ahn to have the first and second sets of gas supply holes taught by Fujikawa et al. The motivation for making such a modification, as taught by Fujikawa et al. (Column 2, Lines 13-16; Column 9, Line 60 - Column 10, Line 22), would have been to separately but simultaneously supply two different process gases through the gas supply portion.

**8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. in view of Ahn and Fujikawa et al. as applied to Claim 1 above, and further in view of U.S. Patent 5,422,139 to Fischer.**

The teachings of Okamoto et al., Ahn, and Fujikawa et al. were discussed above.

The combination of Okamoto et al., Ahn, and Fujikawa et al. does not expressly teach that the exhausting device can discharge gas from the vicinity of the periphery portion of the gas supply member.

Fischer teaches that gas can be discharged through channels 5 and 18 that are on the periphery portion of the gas supply member 12. (Figure 4; Column 8, Lines 34-48)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by the combination of Okamoto et al., Ahn, and Fujikawa et al. to have the exhausting device discharge gas from the vicinity of the periphery portion of the gas supply member, as taught by Fischer. The motivation for making such a modification, as taught by Fischer (Column 3, Lines 28-58), would have been to optimize the gas flow

in order to prevent large area gas flow across the surface of the substrate, which prevents the gas from fully reacting.

**9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. in view of Ahn and Fujikawa et al. as applied to Claim 1 above, and further in view of U.S. Patent 5,404,079 to Ohkuni et al. and U.S. Patent 6,099,687 to Yamazaki.**

The teachings of Okamoto et al., Ahn, and Fujikawa et al. were discussed above. Specifically, Okamoto et al. teaches that the power applying device includes one electrode 5 surrounding the space between the article 3 to be coated and the gas supply surface 4.

The combination of Okamoto et al., Ahn, and Fujikawa et al. does not expressly teach that the power applying device should include four divided electrodes, each with a high frequency power source, that each electrodes should have a bent shape, or that the electrodes should be disposed in a quadrilateral shape.

Ohkuni et al. teaches a power applying device including four divided electrodes 2A-2D, each with a bent shape and a high frequency power source 3A-3D. (Figure 12; Column 10, Lines 49-64)

Yamazaki teaches that four divided electrodes 161A-161D can be disposed in a quadrilateral shape. (Figure 2)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by the combination of Okamoto et al., Ahn, and Fujikawa et al. for the power applying device to include four divided electrodes, each with a bent shape and a



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high frequency power source, as taught by Ohkuni et al., and to dispose them in a quadrilateral shape, as taught by Yamakazi. The motivation for including four divided electrodes, each with a high frequency power source, as taught by Ohkuni et al. (Column 3, Lines 1-7 and 28-30; Column 10, Line 49 - Column 11, Line 10), would have been to create a uniform, rotating electric field and a highly dense plasma. The motivation for disposing the electrodes in a quadrilateral shape, as taught by Yamakazi (Column 1, Lines 53-56), would have been to create a uniform plasma for processing large and/or square substrates. The motivation for having each electrode with a bent shape (i.e. disposing the electrodes in the corners of the quadrilateral chamber), as taught by Ohkuni et al. (Figure 12; Column 6, Lines 12-13; Column 10, Lines 56-61), would have been to place the divided electrodes around the entire periphery of the chamber.

**10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. in view of Ahn and Fujikawa et al. as applied to Claim 1, and further in view of Japanese Patent Application Publication 2001-189308 to Fujita et al. The following rejection refers to the Figures and English Abstract of Fujita et al.**

The teachings of Okamoto et al., Ahn, and Fujikawa et al. were discussed above.

The combination of Okamoto et al., Ahn, and Fujikawa et al. does not expressly teach that the distribution density and area of opening of the gas supply holes vary with radial distance from the center of the gas supply surface.

Fujita et al. teaches that the distribution density and area of opening of the gas supply holes 51, 52, 53 vary with radial distance from the center of the gas supply surface 54. (Figure 7; Solution section of English Abstract)

It would have been obvious to one of ordinary skill in the art to modify the gas supply surface taught by the combination of Okamoto et al., Ahn, and Fujikawa et al. to vary the distribution density and area of opening of the gas supply holes with radial distance from the center of the surface, as taught by Fujita et al. The motivation for making such a modification, as taught by Fujita et al. (Solution section of English Abstract), would have been to improve the uniformity of the rate of film formation and the quality of the formed film.

### ***Response to Arguments***

11. Applicant's arguments with respect to claims 1-4 and 15 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

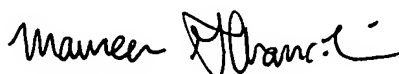
12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patents 6,126,753 to Shinriki et al. and 6,148,761 to Majewski et al. teach dual channel gas distribution plates.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571) 272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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